Appl. No. 10/001,553
Amdt. dated October 12, 2005
Reply to Office Action of June 29, 2005

REMARKS

Claims 1-3, 8, 18-20 and 25-36 are currently pending in this application. Claims 1 and 18 have been amended to more particularly point out Applicant's invention. No new matter.has been added to this application.

Rejection of Claims 1-3, 8, 18-20, 25, 28, 29 and 31 under 35 U.S.C. § 103 (a)

The Examiner has rejected claims 1-3, 8, 18-20, 25, 28, 29 and 31 under 35 U.S.C. § 103 (a) as being unpatentable over U.S. Patent No. 6,075,895 (Qiao) in view of U.S. Patent No. 6.252.599 (Natsuko). The Examiner contends that Qiao discloses a method for determining a gesture. The Examiner correctly notes that Qiao does not teach or disclose a method that remotely issues commands to a medical imaging workstation or that the commands result in translational and rotational manipulation of a medical device. The Examiner contends that Natsuko discloses a method that remotely issues commands to a medical imaging workstation and that the commands result in translational and rotational manipulation of a medical device. The Examiner argues that it would have been obvious to combine the methods of Qiao and Natsuko to create a virtual endoscope that is gesture-controlled. Applicants respectfully traverse the rejection.

The present invention is directed to a method for automatically remotely issuing commands to a medical imaging workstation. A change in a background of an image from a plurality of images is determined. An object in the image is determined. A gesture is identified according to the trajectory and motion pattern of the object. A determination is made as to whether the motion pattern corresponds to a valid command by classifying the motion pattern along windows in time. If the motion pattern corresponds to a valid command, the command is executed resulting in translational and rotational manipulation of a medical device based on the command.

7

Appl. No. 10/001,553
Amdt. dated October 12, 2005
Reply to Office Action of June 29, 2005

Qiao discloses a method for recognizing a gesture of an image of a player. A portion of a background image is removed and replaced with the player's image which is mapped to a number of templates to generate a number of template outputs. The template outputs are analyzed to identify pre-defined gestures that correspond to gestures in the image. Qiao is directed to a player of a video game in which a player's movements are replicated by an image of the player that is portrayed on the game display. As such, if the player creates a gesture that emulates kicking or throwing a ball, that gesture is replicated by the player's image.

Applicants submit that Qiao's use of gestures is different than that of the present invention. Applicants' invention is directed to using a gesture to communicate commands to a medical imaging workstation that are to be executed by a medical device such as a virtual endoscope. Qiao uses template matching to identify a gesture. Template matching focuses on a preassembled set of rules or gestures. The rules are used to match a gesture to a particular template. If a match is discovered, the resulting gesture is performed.

The present invention uses detection of motion patterns over time to identify a gesture. This is significant because when a motion pattern is detected, it is further monitored to determine the duration of the motion which corresponds to the intensity and scale of the resulting command (see claim 27). Applicants submit that Qiao does not teach or disclose identifying the motion pattern of an object as recited in independent claims 1 and 18. Furthermore Qiao does not teach or disclose a system or method that determines whether a gesture corresponds to a valid command and then instructing a device to execute the command resulting in rotation and translation of the medical device as recited in amended claims 1 and 18. Applicants respectfully submit that Qiao does not teach or disclose Applicants' invention as claimed.

Natsuko discloses a conventional image display system in which an image is displayed and manipulated using a standard input device such as a mouse or

8

Appl. No. 10/001,553
Amdt. dated October 12, 2005
Reply to Office Action of June 29, 2005

trackball. Natsuko does not teach or disclose a gesture interface for relaying commands to a medical imaging workstation to be performed by a medical device. Applicants respectfully submit that Natsuko does not teach or disclose Applicants' invention as claimed.

Applicants further submit that the combination of Qiao and Natsuko does not teach or disclose Applicants' invention. Neither Qiao nor Natsuko, whether taken alone or in combination, teach or disclose identifying a gesture according to the trajectory and motion pattern of an object. Furthermore, Applicants' invention is directed to solving the problem raised in Natsuko, namely the tying of a physician to a mouse or trackball for manipulating a medical device. The present invention provides an improvement to this technique by allowing the physician to manipulate the medical device without requiring a particular input device. This provides the benefit of not compromising the sterility of the physician's hands and provides an effective way for the physician to manipulate a device in a precise and effective manner.

Applicants submit that the Examiner is using the hindsight of Applicant's invention to combine Qiao and Natsuko to render obvious Applicants' invention. However, the combination of Qiao and Natsuko, even if combinable does not teach Applicants' invention. Neither reference teaches a technique for recognizing gestures based on motion patterns over time. Claims 2, 3, 8, 19, .20, 25, 28, 29 and 31, being dependent upon claims 1 and 18 are also not taught or disclosed by the references. Applicants request that the rejection of claims 1-3, 8, 18-20, 25, 28, 29 and 31 under 35 U.S.C. § 103(a) be withdrawn.

Rejection of claims 26 and 34 under 35 U.S.C. § 103 (a)

The Examiner has rejected claims 26 and 34 under 35 U.S.C. § 103 (a) as being unpatentable over Qiao in view of Natsuko and further in view of U.S. Patent No. 6,332,038 (Funayama). Applicants respectfully traverse the rejection.

9

Appl. No. 10/001,553
Amdt. dated October 12, 2005
Reply to Office Action of June 29, 2005

Claims 26 and 34 depend upon amended independent claims 1 and 18 which are directed to a method for automatically remotely issuing commands to a medical imaging workstation. Claims 1 and 18 further recite determining if a motion pattern corresponds to a valid command by classifying the motion pattern along windows in time. As discussed above, neither Qiao nor Natsuko teach or disclose these limitations.

Funayama disclosed an image processing device that obtains an electronic image and is able to extract a partial image from the original image. Like Qiao and Natsuko, Funayama does not teach or disclose a method for automatically remotely issuing commands to a medical imaging workstation. Nor does Funayama teach or disclose determining if a motion pattern corresponds to a valid command by classifying the motion pattern along windows in time. Applicants respectfully submit that neither Qiao nor Natsuko nor Funayama, whether taken alone or in combination, teach or disclose Applicant's invention as recited in independent claims 1 and 18. Claims 26 and 34 being dependent upon independent claims 1 and 18 respectively, are also not taught or disclosed by the combination of references. Applicants request that the rejection of claims 26 and 34 under 35 U.S.C. § 103 (a) be withdrawn.

Rejection of claims 27 and 33 under 35 U.S.C. § 103 (a)

The Examiner has rejected claims 27 and 33 under 35 U.S.C. § 103 (a) as being unpatentable over Qiao in view of Natsuko and further in view of U.S. Patent No. 5,875,257 (Marrin). Applicants respectfully traverse the rejection.

Claims 27 and 33 depend upon amended independent claim 1 which is directed to a method for automatically remotely issuing commands to a medical imaging workstation. Claim 1 further recites determining if a motion pattern corresponds to a valid command by classifying the motion pattern along windows in time. As discussed above, neither Qiao nor Natsuko teach or disclose these limitations.

10

Appl. No. 10/001,553
Amdt. dated October 12, 2005
Reply to Office Action of June 29, 2005

Marrin discloses an apparatus for continuous sensing of hand and arm gestures. The sensed parameters are transduced into electrical signals indicative of the parameter quantities. The signals are used to control the performance of a musical composition. Like Qiao and Natsuko, Marrin does not teach or disclose a method for automatically remotely issuing commands to a medical imaging workstation. Nor does Marrin teach or disclose determining if a motion pattern corresponds to a valid command by classifying the motion pattern along windows in time. Applicants respectfully submit that neither Qiao nor Natsuko nor Marrin, whether taken alone or in combination, teach or disclose Applicants' invention as recited in independent claim 1. Claims 27 and 33, being dependent upon independent claim 1, are also not taught or disclosed by the combination of references. Applicants request that the rejection of claims 27 and 33 under 35 U.S.C. § 103 (a) be withdrawn.

Rejection of claims 30 and 32 under 35 U.S.C. § 103 (a)

The Examiner has rejected claims 30 and 32 under 35 U.S.C. § 103 (a) as being unpatentable over Qiao in view of Natsuko and further in view of U.S. Patent No. 6,501,515 (Iwamura). Applicants respectfully traverse the rejection.

Claims 30 and 32 depend upon amended independent claim 1 which is directed to a method for automatically remotely issuing commands to a medical imaging workstation. Claim 1 further recites determining if a motion pattern corresponds to a valid command by classifying the motion pattern along windows in time. As discussed above, neither Qiao nor Natsuko teaches or discloses these limitations.

Iwamura discloses an electronic appliance remote controller which includes a display screen for displaying icons representing possible operations of the electronic appliance. Like Qiao and Natsuko, Iwamura does not teach or disclose a method for automatically remotely issuing commands to a medical imaging workstation. Nor does Iwamura teach or disclose determining if a
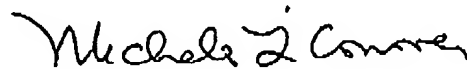
11

Appl. No. 10/001,553
Amdt. dated October 12, 2005
Reply to Office Action of June 29, 2005

motion pattern corresponds to a valid command by classifying the motion pattern along windows in time. Applicants respectfully submit that neither Qiao nor Natsuko nor Iwamura, whether taken alone or in combination, teach or disclose Applicant's invention as recited in independent claim 1. Claims 30 and 32, being dependent upon independent claim 1, are also not taught or disclosed by the combination of references. Applicants request that the rejection of claims 30 and 32 under 35 U.S.C. § 103 (a) be withdrawn.

Conclusion

Applicant respectfully submits that claims 1-3, 8-13, 16-20 and 25-36, as amended, are in condition for allowance and request that a timely Notice of Allowance be issued in this case. The Examiner is invited to contact the undersigned should he have any questions in this matter.

Respectfully submitted,

Michele L. Conover
Reg. No. 34,962
Attorney for Applicant

Date: October 12, 2005
Siemens Corporation
Customer No. 28524
(732) 321-3013

12